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**Soviet Industry and Transportation in 1987:**  
**A Year of Adjustments?**

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Soviet industry and transportation faltered in 1987, failing to sustain the pace of 1986 and creating slippage in critical areas of Gorbachev's modernization program. Growth in overall industrial output--after a 2.5-percent gain in 1986--dropped to 1.6 percent, just equalling the average annual rate of increase in 1981-85. Mediocre results were registered almost across the board, with growth in seven out of ten branches of industry down compared with 1986. Zero growth in civil machine-building production led the downturn, with shortfalls in equipment deliveries reverberating throughout industry and the transport network. Harsher than normal winter weather in the early part of the year, the introduction of a disruptive quality control campaign, difficulties with limited tryouts of self-financing and other new economic reforms, retooling efforts, and a slackening of labor discipline all contributed to the year's poor showing.

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Prospects for 1988 appear equally gloomy. The Soviet leadership has set in motion measures that are designed to alter further the way workers, factory managers, and planners operate, but preparations for the new measures to date have been inadequate. This rash of changes--if implemented at full force--will further disrupt Soviet industry and the transport system. Although Moscow is probably banking that upheaval can be minimized, it could face severe supply disruptions industrywide, a drop in economic performance, and increased worker discontent this year. Milder weather than last year, however, could offset obstacles to growth to some degree.

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This memorandum was prepared by the Industrial Analysis Branch,  
 Office of Soviet Analysis

Comments and questions are welcome and can be  
 directed to Chief, Economic Performance Division

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Soviet Industry and Transportation in 1987:  
A Year of Adjustments?

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Aggregate Performance

Growth in overall industrial output--after a 2.5-percent gain in 1986--dropped to 1.6 percent in 1987, just equalling the average annual rate of increase in 1981-85 (see table 1). Mediocre results were registered almost across the board, with growth in seven out of ten branches of industry down compared with 1986 (see figure 1). Moreover, roughly one of every four industrial enterprises did not meet scheduled contract deliveries last year.

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Leading the downturn, the civilian machine-building industries posted broad--and in some cases, deep--shortfalls from physical output targets. Attempts to make up persisting production backlogs with traditional last-minute storming proved fruitless. Output of one-half of machinery products lagged further behind plan at yearend than in October. Output of producer durables rose a mere 0.3 percent, and consumer durables production declined.

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Basic materials--metals, chemicals, wood products, and construction materials--staged a sluggish comeback from a rocky start at the beginning of the year, but could not match 1986 growth. Wood products, and, to a lesser extent, construction materials and chemicals, received harsh criticism for continued production bottlenecks. Ferrous and nonferrous metals did little better, off the pace of 1986. The soft goods industry--one of the few branches to improve slightly its 1986 output record--failed, however, to generate much improvement in product variety or quality. Procurements of many key agricultural products increased last year, but growth of processed-foods output--excluding alcoholic beverages--was down slightly compared with 1986. Infusions of investment and new capacity combined to boost output of oil, natural gas, coal, and electricity.

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What Went Wrong?

Harsher than normal winter weather in the early part of the year, the introduction of a disruptive quality control campaign (see inset), difficulties with limited tryouts of self-financing and other new economic reforms, retooling efforts, and a slackening of labor discipline all lay behind the year's disruptions, leaving scars of varying depth on individual branches of industry. The jolt to industry as a whole was likely intensified because of the confluence and synergistic nature of these factors. In one sense, Soviet industry was set up for a

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Table 1

USSR: Growth of Industrial Production and Transportation<sup>a</sup>

(average annual rate of growth, percent)

	1971-75	1976-80	1981-85	1985	1986	1987 <sup>b</sup>
Total industry	5.4	2.7	1.7	1.5	2.5	1.6
Fuels	5.2	3.1	0.9	NEGL	3.5	2.5
Electric power	7.0	4.5	3.6	3.5	3.6	4.1
Ferrous metals	4.0	1.0	0.8	0.7	3.3	2.2
Nonferrous metals	5.7	1.5	2.0	3.0	3.0	1.9
Machine building	6.7	3.8	1.1	1.4	2.5	0
Chemicals	8.3	3.0	3.8	4.1	4.5	3.2
Construction materials	5.1	1.4	1.4	1.4	3.9	3.1
Wood products	2.5	-0.6	2.1	2.1	4.6	2.0
Soft goods	2.6	2.4	1.6	2.4	1.5	1.8
Processed foods <sup>c</sup>	4.1	1.4	1.9	-1.7	-4.8	0
Freight transportation <sup>d</sup>	6.6	4.3	2.9	1.7	5.0	0.7

<sup>a</sup> Official Soviet measures of aggregate growth are believed to contain an upward bias because of increased double counting over time and disguised inflation. Although we accept official Soviet data for physical output of various commodities, the aggregate measures shown for each industrial branch were derived synthetically. The growth rates are formed by combining the value of a sample of products for each branch, with interbranch purchases excluded, using 1982 value-added weights.

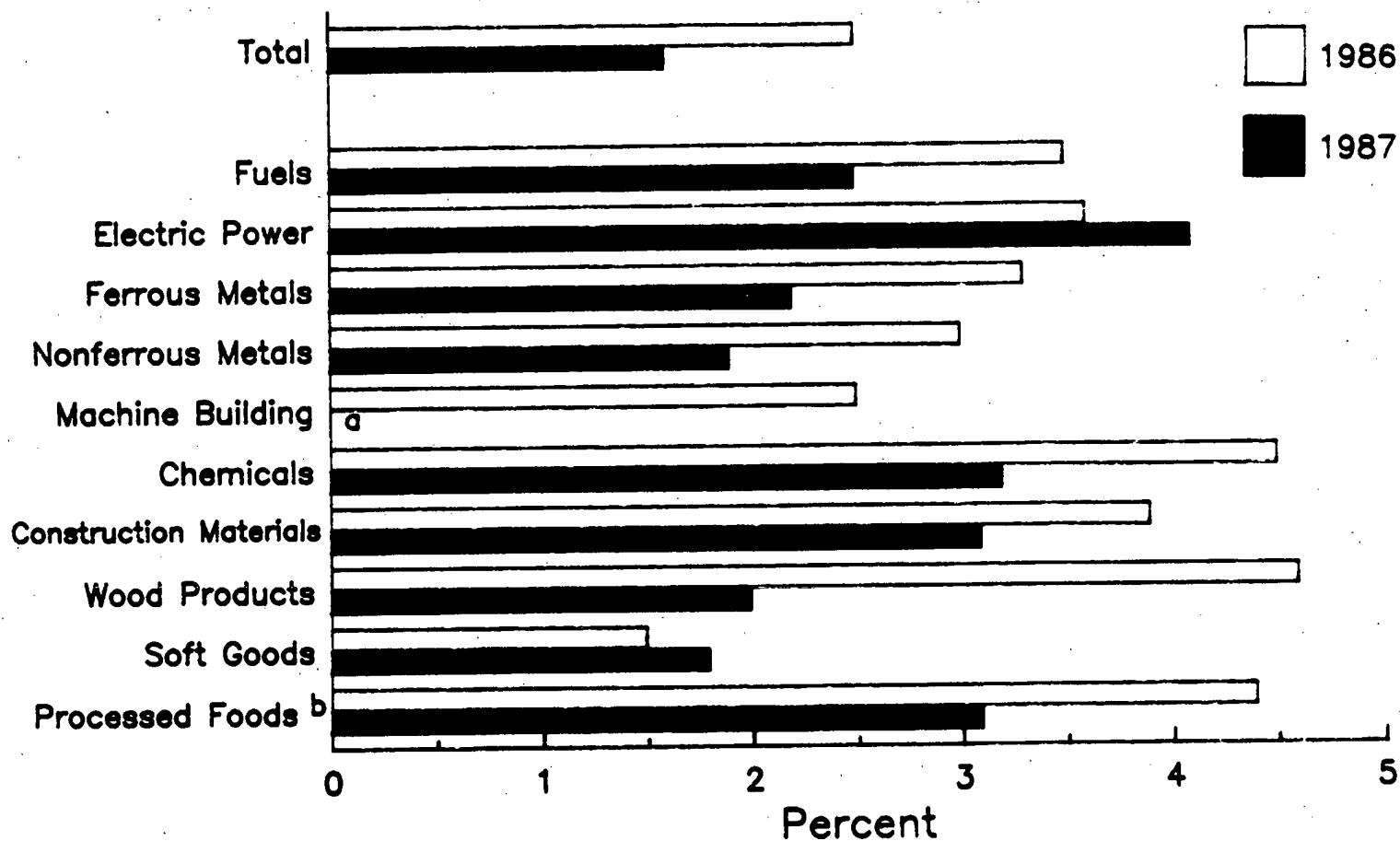
<sup>b</sup> Preliminary.

<sup>c</sup> Including alcoholic beverages. Growth of food-processing industry output in 1986 and 1987 excluding alcohol was 4.4 percent and 3.1 percent, respectively.

<sup>c</sup> Growth rates calculated from ton-kilometer data.

Figure 1

## USSR: Growth of Industrial Production



<sup>a</sup> Machine-building output did not grow in 1987.

<sup>b</sup> Excluding alcoholic beverages.

[REDACTED]

Inset

The Crackdown on Quality: Any Real Improvements?

In keeping with General Secretary Gorbachev's call to raise the quality of Soviet products to world-class levels by the end of the century, the USSR formally instituted a high-profile system of quality control in some 1,500 industrial enterprises in January 1987. The new program--known as state acceptance--put a permanent staff of inspectors at individual plants to ensure Soviet products meet stringent quality standards. Inspectors have the right to reject items at any stage of the production process and are the final arbiters on matters of quality. The system is similar to--and may have been modeled after--the program used by the military for many years to maintain the quality of defense goods. [REDACTED]

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Although state acceptance has created pockets of better goods, [REDACTED] overall progress has been limited. Consumers continue to complain about products that have the new state acceptance stamp breaking down. One inspector noted that while the quality of consumer goods has risen significantly, they are still inferior to those produced in the West. A deputy chairman of the State Committee for Standards, Boris Sokolov, admitted in a recent interview that industry has not yet achieved the noticeable improvement in quality that Moscow wants. [REDACTED]

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fall as it attempted to adjust to Moscow's inherently inconsistent program of simultaneously increasing production, upgrading machinery, and improving quality. [REDACTED]

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A record cold snap in January and unseasonably heavy snowfalls in February hit hardest at basic materials, probably accounting in large part for the falloff in growth. Production stalled because of interruptions of raw-material supplies, transport bottlenecks, and increased requirements for fuel and lubricants. Output of these products bounced back by mid-year, but the recovery was not as rapid or as complete as in 1982 or 1985--years of similar bad weather. [REDACTED]

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New quality control strictures further diminished Soviet industry's capacity to accelerate growth, at times bringing production to a virtual standstill and diverting resources and attention to the repair of rejected goods. Moreover, unlike the disruptions spawned by the weather, state acceptance dampened production during the entire year. Accounting for nearly three-fifths of the program's 1,500 participants, machine building bore the brunt of its efforts. Indeed, senior industry officials point to the tougher new standards as the major cause of the branch's dismal performance. Chairman of the Council of Ministers' Bureau for Machine Building, Ivan Silayev, contended in a recent Ogonek interview, "that at least 35 to 40 percent of plan nonfulfillment should be attributed to the difficulties resulting from the introduction of the state acceptance system." With fewer enterprises covered by the program, basic materials and soft goods escaped widespread problems from state acceptance. The food-processing and energy branches were not included in the new system in 1987. [REDACTED]

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Self-financing and other economic reforms--which are intended to grant increased operating autonomy to enterprise managers--also left their mark on selected facilities. Confused by contradictory directives from above, many plant officials floundered, trying to find reliable suppliers and meet contract obligations. Most affected by the changes were machine building, light industry, and a handful of ministries in the basic materials sector. [REDACTED]

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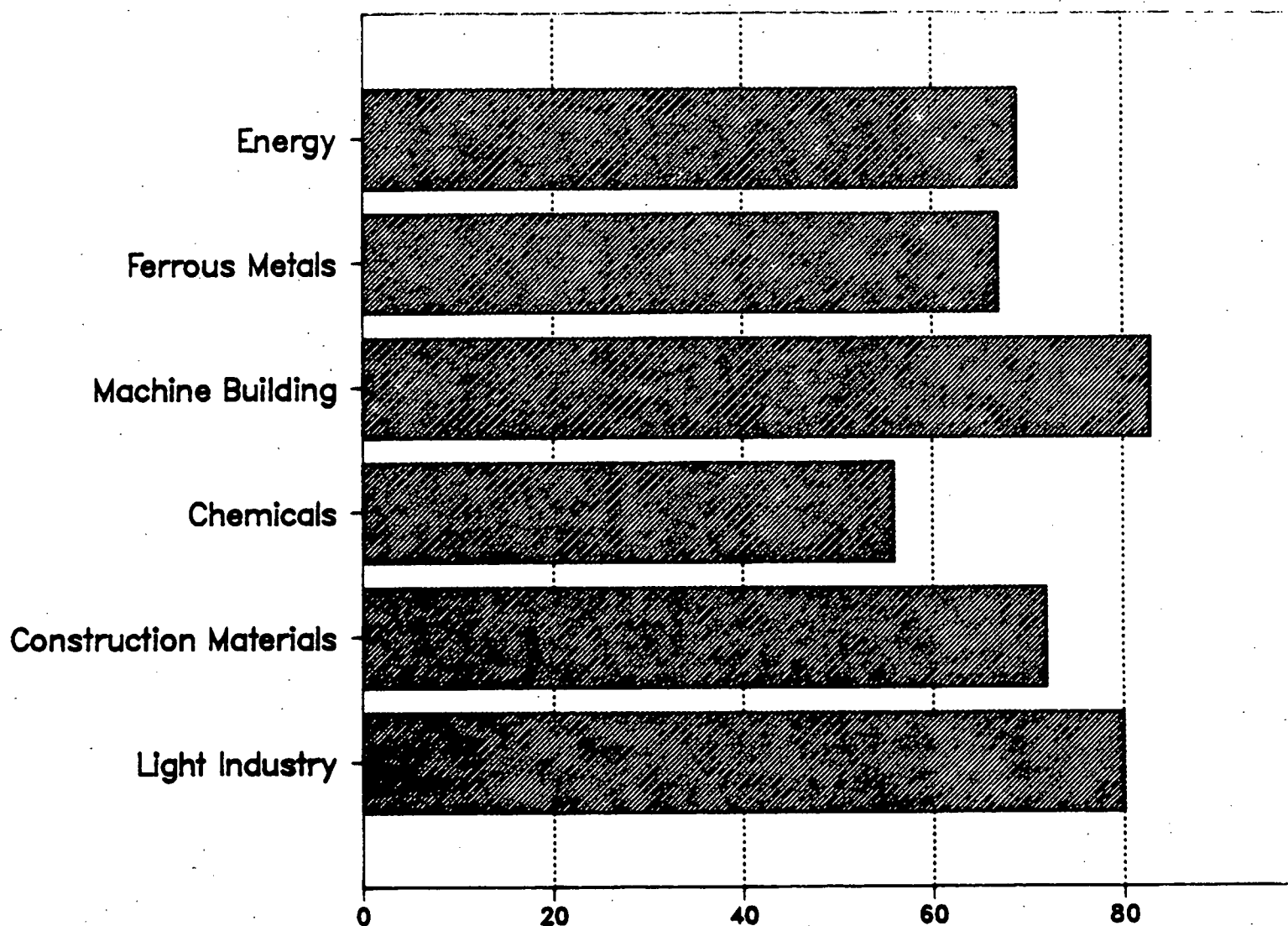
Despite extensive investment over the past two years, the Soviets fell far short of their plan to bring new capacity on stream and replace obsolete equipment--in part because of the inability of machine builders and the construction ministries to fulfill their commitments to customers, pressure on enterprises to meet planned production goals, and the increased complexity inherent in renovation versus new construction (see figure 2). Such a slowdown in machinery deliveries and installation will press on the jugular of Gorbachev's modernization strategy. [REDACTED]

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Figure 2

USSR: Percent of Planned Capital Construction  
Projects Completed in 1987





Difficulties on the labor front also contributed to industry's failure to meet output targets. [redacted] losses in worktime increased substantially in 1987, compared with 1986. Most of the losses can be attributed to authorized absences--caused by supply interruptions and idle equipment. Compounding these problems, Moscow lost ground in its human factors campaign--the spur to improved economic performance in 1985-86. Buffeted by wage cuts and increased unpaid overtime --not officially recorded as worktime--because of state acceptance and policies to squeeze greater effort from the labor force, Soviet workers balked, at times resorting to work stoppages and turning back increasingly to loafing and drinking in the work place. [redacted]

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### Looking Ahead

Prospects for 1988 appear to be even less favorable. Despite last year's traumas, Gorbachev and his lieutenants have clearly indicated that they will stay the course of economic revitalization. They have set in motion measures that are designed to alter further the way workers, factory managers, and planners operate. As of 1 January, managers across a broad swath of industry and the transport system must now contend with self-financing rules, the expansion of the quality control campaign, even more frenetic retooling efforts, and the phasing in of untried supply and planning reforms (see inset). [redacted]

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This rash of changes could disrupt Soviet industrial production even more than in 1987. Moscow is likely banking that upheaval can be minimized, but chances for even more dismal performance have heightened because preparations for the new measures to date have been inadequate [redacted]

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[redacted] More severe supply disruptions, a drop in economic performance, and increased worker discontent could bring the reformist leaders under heavy pressure and personal criticism, perhaps jeopardizing the continuation of Gorbachev's program. [redacted]

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Moscow may, however, enjoy a few breaks. January data indicate the weather was a little milder than normal, and long-range forecasts predict the country will not suffer the extreme temperatures and heavy snowfall recorded last year, removing a critical obstacle to growth. As a result, 1988 performance (at least during the first quarter) may be buoyed by comparison with poor 1987 results. [redacted]

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### Fuels and Electric Power

The major energy producing industries--oil, natural gas, coal, and electric power--posted good performance in 1987 (see table 2). Primary energy output grew more than 3 percent,

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Reforms in Soviet Industry and Transportation in 1988

<u>Reform</u>	<u>1988 Coverage</u>
Self-financing	60 percent of all industrial production; 40 percent of all enterprises; 100 percent of transportation
Wages	60 to 70 percent of work force
Planning	All enterprises and associations. However, in 1988, state orders make up 80 percent of industrial production, including 90 percent in the fuel ministries and 60 percent in the eight civilian machine-building ministries.
Supply (wholesale trade)	Less than 4 percent of total industrial production; 15 to 20 percent of sales through state supply networks.
Quality control	732 more enterprises; for first time includes food-processing industry. Roughly 80 percent of machine- building output and more than 30 percent of all industrial production will be covered.
Organizational changes	All central ministries, republic central committees, and republic councils of ministers.
Prices	None

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Table 2

## USSR: Production of Fuels and Electricity

	<u>1980</u>	<u>1985</u>	<u>1981 -85<sup>a</sup></u>	<u>1986</u>	<u>1987<sup>b</sup></u>	<u>1990 Plan<sup>a</sup></u>
Oil <sup>c</sup> (million barrels per day) (annual growth, percent)	12.03 -	11.91 -2.8	- -0.2	12.30 3.4	12.48 1.5	12.5-12.8 1.0-1.5
Natural gas (billion cubic meters) (annual growth, percent)	435 -	643 9.5	- 8.1	686 6.7	727 6.0	835-850 5.4-5.7
Coal (million raw tons) (annual growth, percent)	716 -	726 2.0	- 0.3	751 3.4	760 1.2	780-800 1.4-2.0
Electricity (billion kilowatt- hours) (annual growth, percent)	1,294 -	1,544 3.5	- 3.6	1,599 3.6	1,665 4.1	1,840- 1,880 3.6-4.0

<sup>a</sup> Growth rates shown are annual averages for 1981-85 and 1986-90.

<sup>b</sup> Preliminary. The apparent discrepancy between volume and growth indicators for 1987 is a result of Soviet reporting practices. Production volumes shown are those reported by the State Committee for Statistics. Because the reported volumes and growth rates embody different degrees of rounding by the Soviets, however, the rate of growth shown here may be based on either volume or reported growth, whichever yields the most precise measure of the actual percentage increase achieved in 1987.

<sup>c</sup> Including gas condensate.

enabling the economy to be relatively free of energy bottlenecks and to boost fuel exports. Maintaining growth in energy output, however, claimed a substantial share of Soviet investment, nearly 20 percent of total investment economywide and more than 40 percent of all investment in industry. As long as the energy industries produce near the current pace and energy exports remain the prime source of hard currency revenues, Moscow will probably accept energy's cost as necessary. A notable slippage in performance during 1988 could, however, trigger debate about the cost of present policies that emphasize energy production over conservation and more efficient use.

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### Oil

Oil production, continuing the turnaround that began in 1986, rose to an average of 12.48 million barrels per day (b/d) in 1987, 150,000 b/d above plan and 180,000 b/d above output attained in 1986. Moscow achieved this growth primarily through another large infusion of resources and equipment. We estimate that the number of well completions and the amount of drilling in the key West Siberian region--which accounts for about two-thirds of national oil production--increased as much as 20 percent in 1987. In addition, West Siberian oilmen accelerated the commissioning of new fields

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The press also reported that production at a large number of older wells at Samotlor--the USSR's largest oilfield--was transferred to less-deep oil-producing layers, allowing Moscow to achieve a relatively quick gain in short-term production capacity at little cost. Productivity of these wells, however, will probably fall rapidly because of the high gas and water saturations found in these reservoirs. The 1988 plan calls for oil production of 12.47 million b/d, but maintaining even the current level of output will require accelerated investment in resources and equipment. In a December TASS report, oil minister Vasily Dinkov called this year's plans "quite challenging."

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### Natural Gas

Natural gas output rose to 727 billion cubic meters in 1987, a slightly slower expansion than during 1986. Ample new transport capacity was constructed in large-diameter pipelines, and additions to compressor stations continued at a brisk pace. The Soviets claim that they now can install 6,000 to 7,000 kilometers of large gas trunklines each year, as well as 3,000 kilometers of smaller pipelines for gathering at gas fields and distribution to regional gas networks. Although lags in drilling and well completions at the Yamburg and Urengoy gas fields have become a nagging problem, they seem to be having only a marginal effect on the industry's output. Similarly, the development of the substantial sour gas reserves of the Pre-Caspian Basin is

proceeding despite numerous delays and difficulties. Consequently, the gas industry is likely to have another good year in 1988. [REDACTED]

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### Coal

After achieving record growth in 1986, raw coal production increased again--albeit more slowly--in 1987, reaching 760 million tons and exceeding planned output by almost 15 million tons. Recent growth in coal production, however, must be viewed in the context of the declining average energy content of Soviet coal. The 1986 Soviet handbook of economic statistics finally acknowledged a decrease of roughly 10 percent in the energy content of coal since 1980. This decline can be explained by the larger share of production coming from low-quality coal deposits in Siberia, deteriorating mining conditions in the Ukraine, and indiscriminate mining operations that result in a sizable amount of rock in the coal delivered. Moreover, we believe that much of the growth in raw coal production in 1986 was attained through increasing the number of mine development shifts at selected underground mines. This "shot in the arm" did not carry over into 1987, and production growth slowed to 1.2 percent, compared with 3.4-percent growth in 1986. We expect that Soviet coal production will, at best, grow marginally in 1988. [REDACTED]

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### Electric Power

Electricity output increased 4 percent in 1987 to 1,665 billion kilowatt-hours, with fossil-fuel, hydro, and nuclear power segments of the industry all improving on their 1986 performance. Nuclear plants overcame the Chernobyl' setback to output growth and produced about 185 billion kilowatt-hours of electricity. At yearend, nuclear generating capacity stood at 34,600 megawatts, 19 percent more than at yearend 1986, but trouble may be brewing for the nuclear power industry (see inset). Four new reactors were added last year, and the third unit at Chernobyl' was returned to service. The successes in the power industry were somewhat clouded by trouble bringing new coal- and natural-gas-fueled capacity on line. Power plant builders completed only about three-fourths of their planned starts, faulting suppliers for shortfalls in equipment delivery and shipment delays. In 1988 the power industry should, nevertheless, be able to maintain growth of electricity output at or near last year's pace. [REDACTED]

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### Ferrous Metals

Ferrous metals output grew 2.2 percent in 1987, down from the previous year's growth of 3.3 percent. Crude steel production rose to 162 million tons, and rolled steel output increased to 114 million tons (see table 3). Modest performance is likely to continue as major steel plant modernization projects

[REDACTED]

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Reviewing the Nuclear Power Program

Since the Chernobyl' accident, plans for nuclear power plants have received tough reviews. Pressure for stricter adherence to safety guidelines is coming from within the industry by design engineers and more active safety inspectors and from nonspecialists, environmentalists, and critics of nuclear power safety standards and their enforcement. [REDACTED]

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A major concern of these groups is the choice of location for new plants. The critics have had some success in getting top authorities to reconsider the selection of a few locations for future plants. Construction plans for a four-reactor plant in Krasnodar were canceled because the proposed site is located in an earthquake-prone area. Similar considerations were probably key factors in the cancellation of the two-reactor addition to the Armenia nuclear power plant. Challenges have also been made to guidelines that allowed nuclear plants to be built close to cities if they would be linked to central heating networks. As a result, startup of the first plants of this type at Gorkiy, Odessa, and Minsk have apparently been placed on hold. This suspension will continue until planners formulate an answer to the criticism that these plants pose too great a risk to city populations. [REDACTED]

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Table 3

## USSR: Production of Ferrous Metals

	<u>1980</u>	<u>1985</u>	<u>1981 -85<sup>a</sup></u>	<u>1986</u>	<u>1987<sup>b</sup></u>	<u>1990 Plan<sup>a</sup></u>
Crude steel (million tons) (annual growth, percent)	147.9 -	154.7 0.3	- 0.9	160.6 3.8	162 0.8	NA
Rolled steel products (million tons) (annual growth, percent)	102.9 -	108.3 0.9	- 1.0	112.0 3.4	114 1.8	116-119 1.4-1.9
Steel pipe (million tons) (annual growth, percent)	18.2 -	19.4 2.5	- 1.3	19.8 2.4	20.3 3	NA
Iron ore (million tons) (annual growth, percent)	244.7 -	247.6 0.4	- 0.2	250.0 1.0	251 0.4	NA
Manganese ore (million tons) (annual growth, percent)	9.8 -	9.9 -2.0	- 0.2	9.3 -6.1	NA NA	NA

<sup>a</sup> Growth rates shown are annual averages for 1981-85 and 1986-90.

<sup>b</sup> Preliminary. The apparent discrepancy between volume and growth indicators for 1987 is a result of Soviet reporting practices. Production volumes shown are those reported by the State Committee for Statistics. Because the reported volumes and growth rates embody different degrees of rounding by the Soviets, however, the rate of growth shown here may be based on either volume or reported growth, whichever yields the most precise measure of the actual percentage increase achieved in 1987.

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lag behind schedule and enterprises struggle to retool production lines while attempting to maintain acceptable output levels.

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Shortfalls in producing a wide assortment of specialty steels and an across-the-board failure to meet delivery schedules were the subject of widespread criticism in the press throughout the year. Pravda reported that the steel industry failed to meet production targets last year for continuously cast billets, rolled products, cold-rolled steel, and drill pipe.

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The introduction of state acceptance at 40 ferrous metallurgy enterprises in 1987 brought disappointing results. A September Pravda article noted that despite attempts to improve quality, virtually no decline in the output of defective steel products has been achieved. Frequent disruptions reportedly prompted production brigades and shop managers to beef up in-house quality control in an effort to minimize the disabling effects of state-sponsored inspections.

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Other programs, designed to improve enterprise profitability and encourage greater output of products needed for the country's industrial reconstruction program, brought mixed results. Several experiments in self-financing introduced at selected steel plants, for example, were praised as successes as Moscow pointed to some improvement in labor productivity. New management conditions put greater emphasis on timely deliveries, but a steady stream of reprobation directed at key plants for failing to meet delivery targets throughout 1987 indicates that the gap between Moscow's plans and the reality of day-to-day operations remains wide. The toughest criticism was directed at the Ukraine--which produces one-third of total Soviet ferrous metals output. The Communist Party issued a special resolution in May demanding improvements from Ukrainian enterprises in meeting delivery targets and instructed Minister of Ferrous Metallurgy Serafim Kolpakov to focus his efforts on improving performance there.

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Some progress was made on major modernization efforts during the year, including the first stages of construction of a new basic-oxygen furnace at Magnitogorsk, the country's largest steel plant. A fifth blast furnace--the world's largest--at the Cherepovets metal combine began operations in April, following an embarrassing accident at the plant three months earlier in which one of Cherepovets' older furnaces tipped over, spilling 35,000 tons of molten steel on the plant floor. Symptomatic of chronic equipment neglect throughout the steel industry, this incident underscores the need for rebuilding and retooling. Efforts to equip steel plants with technically superior furnaces, rolling mills, and continuous casting equipment, however, remained well behind schedule throughout 1987 because of insufficient investment and difficulty assimilating what new equipment was

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made available. [redacted]

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Shortcomings in development of electric-furnace, scrap-use, and steel-finishing technologies probably account for the overtures Moscow made toward the West throughout 1987. During a September press conference, a Soviet representative announced Moscow's intention to open a new era of trade with the United States which would include the iron and steel industries of both countries. One US firm has already signed a licensing agreement for production of corrosion-resistant steel products using Soviet technology, and the USSR has expressed some interest in selling oxygen-furnace conversion technology to US firms. Early in 1987 Italy submitted a joint venture proposal involving the processing of scrap ferrous and nonferrous metals into semifinished products. (The Soviets cut back on exports of scrap throughout the year, reportedly because of increased domestic demand.) We expect the Soviets to pursue such arrangements throughout 1988 as a means to conserve resources and produce more modern steel products. [redacted]

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#### Nonferrous Metals

Output of nonferrous metals rose an estimated 1.9 percent in 1987. Pravda reported that for the first half of 1987, nonferrous metals enterprises fulfilled plans for the production of alumina, zinc, lead, copper, and nickel, but the plan for making rolled products from nonferrous metals was not met. The newspaper also noted that although many enterprises had fulfilled their plans in quantitative terms, most failed to produce the specialized metals required by the national economy. [redacted]

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The major event in the industry in 1987 occurred in early October, when the USSR Council of Ministers changed the union-republic Ministry of Nonferrous Metallurgy into an all-union ministry. As a result, all nonferrous metals industries will now be directly subordinate to the ministry in Moscow. The most immediate impact of this change will be felt in Kazakhstan, which leads the country in output of lead, zinc, and cadmium. The republic is also a major producer of copper, titanium, alumina, and magnesium. As local control over one of Kazakhstan's major industries diminishes, individual enterprises will find themselves under increased pressure from above to modernize their facilities given Moscow's growing displeasure with performance there. [redacted]

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Nonferrous metallurgy officials are still eager to purchase aluminum smelting technology from the United States for use at the large Sayansk aluminum plant. Increased domestic demand for aluminum--as well as a growing export market--has probably induced Moscow to seek ways to boost production and reduce labor requirements at existing smelters such as Sayansk. A pact with Hungary provides for Hungarian alumina refineries to process raw

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bauxite and export the material to the USSR for smelting.

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Other nonferrous metals developments in 1987 included:

- o Opening of a large copper deposit in Udokan in eastern Siberia using a new Soviet-developed technique which enables extraction of 95 percent of the copper in the ore.
- o Expanding nickel-cutting facilities in an attempt to begin exporting cut nickel to the West.<sup>1</sup>
- o Using new technologies to recover waste from ore-dressing processes.

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Despite these achievements, the nonferrous metals industry drew fire from Moscow throughout the year for failing to implement changes in production processes that would provide advanced materials such as nickel alloys and cadmium plating for steels. With the reorganization of the industry in October, the resulting cuts in ministry personnel were apparently a strong signal from Moscow that improved performance is tied to decreased dependence on local planning and supply organs. It is unlikely that such changes will increase enterprise incentives to develop and produce new, quality materials, since the broad introduction of self-financing and wholesale trade in the industry may wreak havoc on existing republic economic plans, which many plants are still responsible for meeting.

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### Machine Building

Last year was a tough one for civil machine builders. They struggled just to meet 1986 production levels and recorded wide fluctuations in month-to-month growth rates. We estimate that for 1987 as a whole, civil machine-building production was flat compared with 2.5-percent growth in 1986. By year's end, the sector had failed to deliver nearly 4 billion rubles worth of output to its customers.

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Machine building's poor production record was characterized by shortfalls in output of both consumer and producer durables. Consumer durables production last year was more than 2 percent below 1986 levels. The industry turned in particularly poor showings for production of radios, televisions, tape recorders, and motorcycles (see table 4). Although somewhat better,

<sup>1</sup> The new cutting mills will help broaden the Soviets' potential export market, which is currently confined to large stainless steel producers. In terms of increasing hard currency earnings, cut nickel attracts a premium of two to three cents per pound more than uncut material.

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Table 4

## USSR: Production of Selected Items of Machinery

	<u>1980</u>	<u>1985</u>	<u>1981</u> <u>-85<sup>a</sup></u>	<u>1986</u>	<u>1987<sup>b</sup></u>	<u>1990</u> <u>Plan<sup>a</sup></u>
<b>Turbines</b>						
(million kilowatts)	19.6	21.6	-	20.9	22.5	NA
(annual growth, percent)	-	1.4	2.0	-3.2	7.7	
<b>Generators</b>						
(million kilowatts)	16.1	12.3	-	14.9	12.8	NA
(annual growth, percent)	-	-2.9	-5.2	21.1	-14.1	
<b>AC electric motors</b>						
(million kilowatts)	51.8	54.8	-	55.8	54.6	NA
(annual growth, percent)	-	1.9	1.1	1.8	-2.2	
<b>Metal-cutting machine tools</b>						
(billion 1982 rubles)	1.861	2.681	-	2.922	2.8	NA
(annual growth, percent)	-	12.2	7.6	9.0	-3.4	
<b>Numerically controlled machine tools</b>						
(billion 1982 rubles)	0.396	1.076	-	1.331	1.3	NA
(annual growth, percent)	-	36.4	22.1	23.7	-0.5	
<b>Industrial robots</b>						
(thousands)	1.4	13.2	-	15.4	14.1	NA
(annual growth, percent)	-	18.9	56.6	16.7	-8	
<b>Instruments and automation equipment</b>						
(billion 1982 rubles)	3.470	4.531	-	4.800	5.0	NA
(annual growth, percent)	-	4.8	5.5	5.9	4.2	
<b>Computer equipment</b>						
(billion 1982 rubles)	2.401	4.202	-	4.761	5.3	NA
(annual growth, percent)	-	13.7	11.8	13.3	11	
<b>Tractors</b>						
(million horsepower)	47.0	52.8	-	54.5	52.1	NA
(annual growth, percent)	-	4.1	2.4	3.2	-4.4	
<b>Television sets</b>						
(millions)	7.528	9.371	-	9.436	9.1	10.6-11.0
(annual growth, percent)	-	4.1	4.5	0.7	-3.6	2.5-3.3
<b>Refrigerators and freezers</b>						
(millions)	5.932	5.860	-	5.948	6.0	6.6-7.0
(annual growth, percent)	-	3.4	-0.2	1.5	0.7	2.4-3.6

Table 4 (continued)

	<u>1980</u>	<u>1985</u>	<u>1981 -85<sup>a</sup></u>	<u>1986</u>	<u>1987<sup>b</sup></u>	<u>1990 Plan<sup>a</sup></u>
Automobiles (millions)	1.327	1.332	-	1.326	1.3	NA
(annual growth, percent)	-	0.4	0.1	-0.5	0.5	

<sup>a</sup> Growth rates shown are annual averages for 1981-85 and 1986-90.

<sup>b</sup> Preliminary. The apparent discrepancy between volume and growth indicators for 1987 is a result of Soviet reporting practices. Production volumes shown are those reported by the State Committee for Statistics. Because the reported volumes and growth rates embody different degrees of rounding by the Soviets, however, the rate of growth shown here may be based on either volume or reported growth, whichever yields the most precise measure of the actual percentage increase achieved in 1987.

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production of producer durables was still at virtually the same level as in 1986. Machine builders fell 15 to 20 percent short of their targets for several important types of industrial equipment--including turbines, forging and pressing machines, and equipment for the chemical, light, and food industries. Over two-thirds of the targets set for the production of advanced and highly-efficient types of output were not met. The only bright spots were production of program control devices for advanced industrial equipment and computer equipment--which grew by 3 and 11 percent, respectively, compared with 1986. [redacted]

25X1

The principal reason for production shortfalls was the introduction of state acceptance. During the first several months of the year, inspectors rejected an average of 20 percent --and in some instances far more--of all the products they checked. For example:

- o At an agricultural machine-building plant, 9 out of every 10 machines did not meet technical requirements during January 1987.
- o Products worth 74,000 rubles were presented to inspectors at the Machine Building Plant imeni V.I. Lenin in Voronezh during the first month of the year, but only 250 rubles worth were accepted.
- o Production at the Yunost Television Plant in Moscow came to a "complete halt" during January after inspectors rejected 100 percent of output. [redacted]

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Because many enterprises were unable to deal with the tough quality standards, Moscow reportedly relaxed them by mid-year. Consequently, although machine builders made some selective gains--by increasing quality awareness on the factory floor, introducing quality-oriented worker incentives, purchasing test equipment, and using inspectors as troubleshooters--they did not achieve the overall quality improvements that the leadership initially expected.<sup>2</sup> Nevertheless, in those areas where quality did improve--notably consumer durables--the resulting drop in production may not have been viewed that negatively, because inspectors kept the shoddiest goods off Soviet shelves, leaving consumers, on average, with more reliable products. [redacted]

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Although unable to ensure the quality of existing products, machine builders reportedly made substantial headway in

<sup>2</sup> To shift worker attention to quality rather than quantity targets, selected enterprises instituted prorated bonuses calculated on the basis of whether output passed inspection on the first, second, or third try. At other production shops, workers responsible for a stipulated number of repeat rejects lost all bonuses, even if physical output goals were achieved. [redacted]

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[REDACTED]

introducing new product lines. During the first six months of 1987, 4.3 percent of the machinery produced reportedly was new; by the end of the year that figure had reached 9 percent. For the fourth quarter alone, 15 percent of the industry's output consisted of new machinery--more than the share Moscow is aiming for by 1990. Open-source reporting suggests, however, that progress may be more form than substance. Many enterprises are meeting targets by making minor adjustments to machines and classifying them as new ones, while others are trying to meet plans without regard for the machines' productivity or reliability. [REDACTED]

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The machine-building industry has been less successful creating new equipment designs. According to the Soviet press, the leadership is not satisfied with scientific achievements of machine builders to date and is impatiently waiting for results. During a July Central Committee meeting, Gorbachev pointed out that assignments for mastering key types of new-generation equipment had been met by only 80 percent, while those for applying advanced technologies fell 7 percent short of the plan. He criticized civil machine builders for insufficient progress in raising the technological level of machinery and stated that the "situation in branch science on the whole remains unfavorable as yet." [REDACTED]

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The Soviet leadership is also pressing machine builders to retool--by replacing outdated industrial equipment with new, highly productive machines. Aggregate Soviet economic data, leadership statements, and press reporting suggest, however, that the retooling effort has run into serious difficulty and is falling far short of leadership expectations. The supply of machinery is below that needed to replace old equipment. Those machines reaching the plant are not being quickly installed, and equipment that is installed is being brought on line slowly:

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- [REDACTED]
- o Moscow planned for a 34-percent increase in machine-building commissionings during 1987, but commissionings rose only 11 percent--a sizable increase over 1986, but still 20 percent below plan. Only 166 out of 200 scheduled projects for construction of new facilities and retooling of existing ones were completed. [REDACTED]

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### Chemicals

Output of the chemical industry grew by 3.2 percent in 1987, compared with 4.5 percent in 1986, as continued strong performance in fertilizer production offset a weakening in most other areas (see table 5). Extremely cold weather disrupted transportation, causing bottlenecks in deliveries of supplies and underutilization of equipment and labor. Energy supplies--particularly natural gas--were diverted to meet residential heating requirements, and power disruptions caused serious problems at several chemical plants. A Soviet official claimed that the results achieved in 1986 did not continue in 1987 in most chemical sectors because the previous year's good performance was the result of one-time surges (such as improved labor discipline) and not fundamental restructuring. [redacted]

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Even among fertilizer products, potash production continued to suffer because of a flooded mine at Berezniki, which accounts for about 15 percent of potash output. Inefficient mining and beneficiation processes at the Soligorsk potash facility continued to cause below-capacity utilization, and shortages of railcars hampered production and distribution. Ammonia output was cut back early in the year because of the diversion of natural gas feedstock, and contracts with some Western customers were not honored. Sulfuric acid output growth slowed in part because of shortages of sulfur, severely affecting supplies for the production of phosphate fertilizer. [redacted]

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Pesticide production fell 2 percent below that of 1986, as the Soviets continued to rely on imported herbicides for their "intensive technology" program in grain cultivation. Caustic soda output was up in 1987, but 3 percent below plan, affecting production in other sectors, especially artificial fibers and dyes that are key inputs to textile manufacturing. In the synthetic materials sector--which supplies chemicals for many consumer goods--growth in the production of plastics and chemical fibers was disappointing. Feedstock supplies continued to be a problem. In June, the Minister of the Chemical Industry was taken to task for meeting only 50 percent of the demand for materials for consumer goods. [redacted]

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Contract fulfillment deteriorated further in 1987. Enterprises of the Ministry of the Chemical Industry, for example, failed to meet contracts for 470 million rubles worth of products. The Ministry of the Petroleum Refining and Petrochemical Industry paid at least 139 million rubles in fines last year, mostly for nonfulfillment of contracts. The principal reasons for failure to meet contract obligations were material and technical supply problems and lags in capital construction. In January-October, for example, the plan for commissioning new fixed assets at enterprises under the Ministry of the Chemical Industry was only 28 percent fulfilled. [redacted]

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Table 5

## USSR: Production of Selected Chemicals

<u>1980</u>	<u>1981</u> <u>1985</u>	<u>-85<sup>a</sup></u>	<u>1986</u>	<u>1990</u> <u>1987<sup>b</sup></u>	<u>Plan<sup>a</sup></u>	
Mineral fertilizers (million tons 100% nutrient equivalent)	24.8	33.2	-	34.7	36.3	41-43
(annual growth, percent)	-	7.7	6.0	4.5	4.6	4.3-5.3
Pesticides (thousand tons 100% active ingredient)	282	346	-	332	327	440-480
(annual growth, percent)	-	0.9	4.2	-4.0	-2	4.9-6.8
Caustic soda (million tons)	2.755	3.056	-	3.229	3.3	NA
(annual growth, percent)	-	2.8	2.1	5.7	2.2	
Sulfuric acid (million tons)	23.033	26.037	-	27.847	28.5	NA
(annual growth, percent)	-	2.8	2.5	7.0	2.2	
Synthetic resins and plastics (million tons)	3.637	5.019	-	5.345	5.5	6.8-7.1
(annual growth, percent)	-	4.2	6.7	6.5	2.9	6.3-7.2
Chemical fibers (million tons)	1.176	1.394	-	1.480	1.5	1.85
(annual growth, percent)	-	-0.5	3.5	6.2	3	5.8
Motor vehicle tires (million units)	60.1	65.2	-	66.0	67.8	NA
(annual growth, percent)	-	2.4	1.6	1.2	2.7	
Synthetic detergents (million tons)	1.012	1.150	-	1.193	NA	NA
(annual growth, percent)	-	4.9	2.6	3.7	NA	

<sup>a</sup> Growth rates shown are annual averages for 1981-85 and 1986-90.

<sup>b</sup> Preliminary. The apparent discrepancy between volume and growth indicators for 1987 is a result of Soviet reporting practices. Production volumes shown are those reported by the State Committee for Statistics. Because the reported volumes and growth rates embody different degrees of rounding by the Soviets, however, the rate of growth shown here may be based on either volume or reported growth, whichever yields the most precise measure of the actual percentage increase achieved in 1987.



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State acceptance--which was introduced at 64 chemical industry enterprises in 1987--caused disruptions in production. Problems included inadequate measuring equipment, use of state standards unrelated to product quality, excessive indicators and paperwork, shipment delays resulting from lack of around-the-clock inspection, and poor quality of raw materials. [REDACTED]

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Adjusting to self-financing also created difficulties at enterprises of the Ministry of the Petroleum Refining and Petrochemical Industry, the Ministry of Chemical and Petroleum Machine Building, and the four plants of the Ministry of the Chemical Industry that were under this system in 1987. In January to October production costs were higher than planned at one-third of the enterprises under the Ministry of the Petroleum Refining and Petrochemical Industry and at one-half of the enterprises under the Ministry of Chemical and Petroleum Machine Building, resulting in unfulfilled profits plans. Because the entire industry was not operating under self-financing, disruptions at other enterprises operating under the old system were numerous. [REDACTED]

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Failure of the Ministry of Chemical and Petroleum Machine Building to supply the chemical industry with necessary equipment also contributed to production problems. Output of chemical equipment and spare parts was 15 percent below planned goals and 3 percent lower than in 1986. Unrealistic targets conflicted with overly ambitious plans for capital investment, plans for replacing outdated capacity with new technology that required shutdowns of production lines, and state acceptance. [REDACTED]

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Realizing that help is needed to modernize the chemical industry, Moscow renewed its dependence on imports of Western chemical equipment and technology. In 1987 contracts with Western firms amounted to about \$1.2 billion, compared with \$1.8 billion for 1981-86 combined. Orders included equipment and technology to produce plastics, synthetic fibers, caustic soda, and ammonia. [REDACTED]

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### Construction Materials

Output of construction materials grew 3.1 percent last year, down from 3.9 percent in 1986. Cement production rose to 137 million tons, and output of precast ferroconcrete increased to 148 million tons (see table 6). [REDACTED]

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Severe criticism from the CPSU Central Committee early in the year resulted in construction materials minister Sergey Voyenushkin firing three industry aides. In addition, a number of key administrative figures were severely reprimanded for failing to improve labor discipline. In June, the Central Committee issued a resolution censuring the construction materials industry for its "unpardonable complacency and

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Table 6

## USSR: Production of Construction Materials

	<u>1980</u>	<u>1985</u>	<u>1981 -85<sup>a</sup></u>	<u>1986</u>	<u>1987<sup>b</sup></u>	<u>1990 Plan<sup>a</sup></u>
Cement						
(million tons)	125.0	130.8	-	135.1	137	140-142
(annual growth, percent)	-	0.7	0.9	3.3	2	1.4-1.7
Precast ferroconcrete						
(million m <sup>3</sup> )	122	136	-	142	148	NA
(annual growth, percent)	-	3.0	2.2	4.4	4.2	
Wall materials						
(billion conventional bricks)	58.0	59.1	-	61.6	NA	NA
(annual growth, percent)	-	-0.2	0.4	4.2	NA	
Roofing materials						
(billion m <sup>2</sup> ) <sup>c</sup>	1.723	1.928	-	2.002	2.0	NA
(annual growth, percent)	-	2.4	2.3	3.8	-1	
Window glass						
(million m <sup>2</sup> )	245	243	-	256	252	NA
(annual growth, percent)	-	-1.6	-0.2	5.3	-1.6	

<sup>a</sup> Growth rates shown are annual averages for 1981-85 and 1986-90.

<sup>b</sup> Preliminary. The apparent discrepancy between volume and growth indicators for 1987 is a result of Soviet reporting practices. Production volumes shown are those reported by the State Committee for Statistics. Because the reported volumes and growth rates embody different degrees of rounding by the Soviets, however, the rate of growth shown here may be based on either volume or reported growth, whichever yields the most precise measure of the actual percentage increase achieved in 1987.

<sup>c</sup> Including pliable roofing materials and waterproofing.

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passivity" in improving timely delivery of quality building materials to construction sites. [REDACTED]

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As a means to acquire improved technology for the industry, Moscow stepped up efforts to improve trade relations with the United States early in the year. Visits of US specialists to the Soviet Union in the first half of 1987 included discussions to cooperate in the production of cement and insulating materials. Although the arrangements are still in the negotiating stage, Soviet trade delegations are actively seeking technology for regulating cement properties and, in turn, have offered concrete mixers, wood-cutting machinery, sawn lumber, and other equipment in exchange. [REDACTED]

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Such trade overtures underline the industry's inability to develop new materials needed for large apartment buildings and other structures. Citing chronic shortages of steel products, Soviet industry specialists are calling for the development of a better construction-grade cement by the year 2000. Technical requirements for the product--such as the ability to produce high-tensile strength, rapid-setting concrete--cannot currently be met by the industry because of obsolete machinery and an incentive system that discourages innovation and has generally prevented the industry from introducing more modern materials. [REDACTED]

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Throughout the year, complaints about waste and poor quality appeared regularly in the Soviet press. The introduction of state acceptance at selected construction materials plants in 1987 brought generally poor results. Without strict quality control and incentives to develop and produce new materials, however, the industry could face another year of providing poor-quality materials to the economy. Improvements in the transport sector will also be needed if the industry is to better its record in providing materials to building sites. [REDACTED]

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#### Wood Products (Timber, Pulp, and Paper, and Wood Processing)

Output of wood products rose by only 2 percent in 1987, compared with a 4.6-percent increase in 1986 (see table 7). More than one-half of all enterprises failed to meet delivery contracts last year. [REDACTED]

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The timber industry came under steady fire during 1987 both from Moscow and local paper producers for failing to deliver raw materials needed for paper and cellulose production. A letter from an official at a major pulp and paper enterprise appearing in Pravda in June claimed that production shortfalls were the result of key timber suppliers failing to deliver the proper grades of timber for their needs. Weather-related railcar shortages were blamed for poor performance early in the year,

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Table 7

## USSR: Production of Wood Products

	1980	1985	1981 -85 <sup>a</sup>	1986	1987 <sup>b</sup>	1990 Plan <sup>a</sup>
Commercial timber <sup>cd</sup> (million trimmed m <sup>3</sup> )	275	277	-	296	295	NA
(annual growth, percent)	-	-1.1	0.1	6.9	-0.4	
Paper (million tons)	5.288	5.986	-	6.156	6.2	7.0-7.2
(annual growth, percent)	-	2.1	2.5	2.8	0.6	3.2-3.8
Newsprint (billion m <sup>2</sup> )	30.0	33.3	-	34.5	35.8	NA
(annual growth, percent)	-	3.7	2.1	3.6	3.8	
Pulp (million tons)	7.132	8.374	-	8.663	NA	10.0-10.2
(annual growth, percent)	-	2.7	3.3	3.5	NA	3.6-4.0
Cardboard (million tons)	3.445	4.034	-	4.239	NA	5.2
(annual growth, percent)	-	1.7	3.2	5.1	NA	5.2
Furniture <sup>c</sup> (billion 1982 rubles)	6.4	7.9	-	8.3	8.7	10.5-10.7
(annual growth, percent)	-	5.3	4.3	5.1	4.8	5.9-6.2

<sup>a</sup> Growth rates shown are annual averages for 1981-85 and 1986-90.

<sup>b</sup> Preliminary. The apparent discrepancy between volume and growth indicators for 1987 is a result of Soviet reporting practices. Production volumes shown are those reported by the State Committee for Statistics. Because the reported volumes and growth rates embody different degrees of rounding by the Soviets, however, the rate of growth shown here may be based on either volume or reported growth, whichever yields the most precise measure of the actual percentage increase achieved in 1987.

<sup>c</sup> These data are contained in the annual plan fulfillment reports; they do not agree with those published in the annual statistical handbook, Narodnoye khozyaystvo SSSR.

<sup>d</sup> Excluding procurement by collective farms.

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when over one million cubic meters of timber awaited transport.

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Official criticism of the industry came from the highest level at mid-year when Gorbachev singled out several industries--including timber, pulp and paper, and wood processing--during his June plenum speech for poor performance and demanded "resolute" changes in attitudes. Shortages of forest-based materials for construction were treated in several major articles, including one in an economic journal that claimed shortages of wood furniture and housing materials threaten Moscow's plans to improve the lot of Soviet consumers and, in turn, boost labor productivity.

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An agreement signed in July setting up a Japanese-Soviet company to manufacture paneling for furniture from Siberian broadleaved trees marked the first enterprise between the two countries under new Soviet joint venture regulations. The Soviets will have control of the company and have agreed to provide raw materials, energy, construction labor, and some transport services. In return Japan will supply manufacturing equipment and managerial and technical expertise. The new enterprise will provide the Soviets with sophisticated wood-processing technology as well as enable them to increase export earnings.

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The combination of a dry autumn in 1986, a snowless winter, and high winds in the spring of 1987 resulted in a massive forest fire in Siberia near the Chinese border in early May. When the fire was finally contained, over 30,000 acres of valuable timber stands had been destroyed. As a result, Soviet timber exports--particularly to China--fell in 1987.

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Retooling the Soviet paper industry is reportedly far behind schedule because of shortages of new machinery and slow progress in installing modern equipment. A July article in Sovetskaya Rossiya noted that the umbrella ministry for the production of equipment for the paper industry had used only 70 percent of its capacity slated for papermaking equipment, in turn creating shortages of corrugated cardboard and filter paper throughout the country.

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Moscow moved in 1987 to punish ministry officials and enterprise managers for severe pollution problems from timber and papermaking operations. Gennadiy Pronin, a deputy minister in the timber ministry since 1981, was fired in May for failing to take appropriate measures to protect Lake Baykal from heavy industrial pollution. According to an editorial in Sotsialisticheskaya industriya last August, the priority for investment in antipollution equipment for the timber and paper industries remains low in spite of rhetoric from high levels in Moscow.

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[REDACTED]

Last year saw only a modest improvement in reducing the high levels of downtime for logging equipment and timber transport machinery, indicating equipment overhaul and replacement in the industry is a drawnout process. If the results from limited introduction of state acceptance in the industry during 1987 are any indication, forest-based industries will have considerable difficulty changing old work habits and increasing the marketability of their products. Moreover, the introduction of self-financing and wholesale trade during 1988--designed to spur competition among enterprises and weed out poor performers--could yield disappointing results since acute paper shortages may prevent Moscow from shutting down inefficient plants despite the low quality of their products. [REDACTED]

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#### Soft Goods

The production of soft goods grew modestly in 1987, increasing 1.8 percent over 1986. Textile output posted the best performance, growing 3.2 percent to reach 12.7 billion square meters, within the goals of the Consumer Goods and Services Program (see table 8). Knitwear production also did well, rising by 3.0 percent, although output was short of plan. Footwear and sewn goods output, however, were disappointing. Footwear production grew by only 1 percent, and output of sewn goods declined. One-third of light industry enterprises were unable to meet their delivery commitments, failing to deliver 1.1 billion rubles worth of goods in 1987. [REDACTED]

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The industry suffered its greatest difficulties in the first two months of the year. The severe winter weather disrupted transportation and power supplies, and the introduction of state acceptance at some enterprises may also have contributed to output slowdowns. A reduced cotton harvest in 1986 and uneven deliveries of man-made fibers by the chemical industry hampered production as well. [REDACTED]

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In addition, some production problems were probably the result of the introduction of self-financing throughout the industry in 1987. The primary indicator of enterprise performance is now the fulfillment of delivery contracts, which are signed with customers at wholesale trade fairs held the year before and are used to form the enterprise's production plan for the coming year. Press reports have indicated, however, that implementation of the new system has been rocky. Enterprises sign contracts to deliver finished products, only to find later that they cannot get the raw materials they need to produce the goods. The contracts must then be renegotiated, delaying production. The Ministry of Light Industry also stepped in to modify and increase the plans of individual enterprises last year--in violation of the provisions of the new procedures--causing many enterprises difficulties in coping with the

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Table 8

## USSR: Production of Soft Goods

	<u>1980</u>	<u>1985</u>	<u>1981 -85<sup>a</sup></u>	<u>1986</u>	<u>1987<sup>b</sup></u>	<u>1990 Plan<sup>a</sup></u>
Textiles (billion m <sup>2</sup> )	10.746	12.052	-	12.310	12.7	14-15
(annual growth, percent)	-	2.5	2.3	2.1	3.2	3.0-4.5
Knitwear (billion articles)	1.623	1.732	-	1.775	1.8	2.2-2.3
(annual growth, percent)	-	3.0	1.3	2.5	3	4.9-5.8
Sewn goods (billion 1982 rubles)	23.5	26.0	-	26.3	25.8	NA
(annual growth, percent)	-	3.6	2.0	1.2	-1.9	
Leather footwear (billion pairs)	743	788	-	801	805	900
(annual growth, percent)	-	3.1	1.2	1.6	1	2.7

<sup>a</sup> Growth rates shown are annual averages for 1981-85 and 1986-90.

<sup>b</sup> Preliminary. The apparent discrepancy between volume and growth indicators for 1987 is a result of Soviet reporting practices. Production volumes shown are those reported by the State Committee for Statistics. Because the reported volumes and growth rates embody different degrees of rounding by the Soviets, however, the rate of growth shown here may be based on either volume or reported growth, whichever yields the most precise measure of the actual percentage increase achieved in 1987.

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conflicting demands of customers and central planners. Nonetheless, self-financing has helped enterprises gain a limited measure of autonomy (see inset). [redacted]

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In October, Minister of Light Industry Vladimir Klyuyev was obliged to respond to formal criticism by the Supreme Soviet, not for the industry's shortfalls in output, but for its failure to take advantage of the new economic mechanisms to improve the quality and variety of its consumer goods.<sup>3</sup> Criticism in the past has generally focused on quantitative measures of performance, with quality taking a back seat. Klyuyev in turn blamed his industry's difficulties in 1987 on the unreliable performance of its suppliers and the difficulty overcoming decades of backwardness. [redacted]

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On the bright side, light industry did increase its output of goods sold at contract prices in 1987. Enterprises now have the right to negotiate prices with their customers for high quality, innovative products. The use of freer pricing for these goods is designed to stimulate the output of better goods and help underwrite the cost of developing new designs. These incentives seem to be helping--the output of goods at contract prices tripled in 1987 over 1986, to make up 4.8 percent of total production. But not everyone considers contract prices a step forward. Consumers complain of the high prices for these goods in letters to newspapers, and the Supreme Soviet also criticized the industry for excessive prices. Although Klyuyev defended higher prices as necessary to cover the costs of producing quality goods, many Soviet officials and consumers do not yet seem to understand the incentive effect of prices on production. [redacted]

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The soft goods industry will probably not be able to make substantial improvements in its performance this year. Supplies of raw materials are likely to remain tight, and the Soviets are still trying to work out contradictions in their new management system. The new high-level emphasis on quality over quantity bodes well, however, for future efforts to reorient enterprises to meeting consumer needs rather than fulfilling the goals of central planners. [redacted]

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### Processed Foods

The processed-food industry enjoyed a relatively good year in 1987, although performance failed to match the unusually strong showing in 1986. Total production--excluding alcoholic

<sup>3</sup> The trade network rejected or downgraded 7 to 9 percent of sewn goods, knitwear, and footwear output in 1987, and accumulated stocks of "unsaleable and slow-moving goods of obsolete fashions, models, and designs" reached 1.4 billion rubles. [redacted]

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## Inset

Light Industry and Machine Building: No Common Thread?

The introduction of self-financing in light industry in 1987 highlighted the disparity between the industry's equipment needs and products produced by its equipment suppliers. Self-financing gives enterprises one important right--to hold on to their funds and refrain from purchasing unnecessary or poorly designed equipment. Although the ministry still orders the production of equipment by machine-building plants, the final purchasing decision is made by light industry enterprises themselves. Now that they are expected to pay for much of this equipment from their own funds, they have proven reluctant to spend hard-earned rubles on equipment of dubious utility. As a result, purchases of a wide range of light industrial equipment have fallen in the past year.

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The cutbacks in equipment purchases have fallen in areas where the ministry's equipment policies have been especially misguided. For example, the "Penzmash" machine-building plant, which produces open-end spinning frames, has the capacity to produce 2,000 frames annually, but received orders for only 150 in 1987. The Soviets introduced open-end spinning extensively in the 1970s, viewing it as a replacement for traditional ring-spinning. Although open-end spinning offers much higher productivity than ring-spinning, it produces weak yarns and thus is suitable only for making heavier yarns. The Soviet abandonment of ring-spinning has resulted in a decline in the production of the fine yarns used to make the lightweight fabrics popular with consumers and limited the industry's production possibilities.

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On the flip side, other machine-building enterprises cannot cope with the demand for their product. The Klimov "Tekmash" machine-building association produces the ATPR rapier loom, which enjoys great popularity in light industry. The rapier loom, developed in the 1950s, offers greater speed and quieter operation than the traditional shuttle loom. Unlike later shuttleless looms, it can accept a wide range and quality of yarns and is relatively easy to operate and maintain. For these reasons, the rapier loom is well suited to Soviet operating conditions. Enterprises also like it because it is small and can be easily installed in the cramped and aged factory buildings that predominate in the textile industry. The Ministry of Light Industry views the rapier loom as outdated, however, and has stymied increased production of this model.

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Light industry's ill-advised technical policy is a result of the Soviet obsession with "catching up with the West." The scientific-research institutes in light industry that develop the equipment designs for production base their decisions on national standards. A model is developed and compared to the leading

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[REDACTED]

analog from the West, judged by factors such as productivity, weight, size, and energy consumption. If it falls short of the Western analog in any of these areas, it is not considered to be "of world level" and cannot be accepted for production. Moreover, the institutes are not authorized to consider price and demand in making their decision. As a result, the designs introduced into production are sometimes ill-suited to Soviet conditions. In addition, the productivity improvements they offer often do not justify their exorbitant prices. [REDACTED]

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Gorbachev's policy of encouraging machine builders to renew their product line more frequently and to make their products "world level" is likely to perpetuate the mismatch of equipment supply and demand in light industry. Light industry enterprises have shown that they are not interested in state-of-the-art equipment but in equipment that will offer reliability and value for their money. They are likely to find the funds they earn for equipment purchases under self-financing of little use if they cannot use them to stimulate the production of the equipment they need. The transfer to wholesale trade in producer durables by 1990 may help make machine builders more responsive to their consumers' needs, but only if they are freed from the demands of a national technical policy that emphasizes high-technology over utility. [REDACTED]

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beverages--grew 3.1 percent. Animal products--meat, sausage, animal fats, and dairy products--all did well, bolstered by continued growth in livestock procurements (see table 9). Granulated sugar output shot up by 7 percent; success was probably the result of a sharp increase in the supply of sugar beets. Output of vegetable oil grew modestly at 2 percent, but somewhat slower growth is not surprising after output skyrocketed in 1986 following several years of serious production declines.

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On the down side, the canned food sector encountered some difficulties with supplies. Although output grew overall by nearly 3 percent, this respectable performance was largely the result of a 9-percent increase in the production of fruit juices. Procurements of potatoes, other vegetables, and fruits and berries were down substantially in 1987, resulting in decreased output of many canned goods. Production of fish products declined 3 percent. The fish industry has had serious problems attracting labor for the grueling work involved in fishing, many nearby fishing zones have been overfished, and vessels are spending excessive time in port, in need of repairs or facing shortages of fuel and other materials. In addition, in any year the success of the fishing industry depends a great deal on the luck of the catch.

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The alcohol sector came in for official reprimand last year. Gorbachev's antialcohol program called for continuing sharp cutbacks in the production of many products with a high alcohol content. Output of fortified fruit and berry wines was to have been reduced to zero in 1987, and production of vodka, cognac, and other spirits was to be cut back substantially for the third year in a row. Although output of many of these products dropped, cutbacks fell short of those called for. Fruit and berry wines continued to be produced, cognac output was up 70 percent at mid-year, and the decline in vodka and other spirits output--16 percent--was lower than expected.<sup>4</sup> The Central Committee "applied party sanctions" to officials from the State Planning Commission, the food industry, the retail trade system, and other bodies for planning an increase in the output and sale of high-alcohol content beverages. the food industry has had trouble retooling many of its factories quickly for the production of other products because of equipment shortages. Planners and food-industry officials may have targeted increases in the output of alcoholic beverages to prevent factories from remaining idle and dragging down total industry performance.

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<sup>4</sup> Despite the decline in state alcohol production, private production seems to be on the rise. The Soviets estimate that sugar sales increased 14 percent in 1987, probably largely the result of purchases for use in home distilling.

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Table 9

## USSR: Production of Processed Foods

	<u>1980</u>	<u>1985</u>	<u>1981 -85<sup>a</sup></u>	<u>1986</u>	<u>1987<sup>b</sup></u>	<u>1990 Plan<sup>a</sup></u>
Meat <sup>c</sup>						
(million tons)	9.140	10.807	-	11.670	12.1	11.7-12.2
(annual growth, percent)	-	1.4	3.4	8.0	3.7	1.6-2.5
Sausage						
(million tons)	3.074	3.414	-	3.555	3.7	NA
(annual growth, percent)	-	3.5	2.1	4.1	4.1	
Fish						
(million tons)	5.0	5.6	-	5.7	5.7	NA
(annual growth, percent)	-	NA	2.3	1.8	-3	
Animal fats/oils <sup>d</sup>						
(million tons)	1.278	1.517	-	1.612	1.7	1.5-1.7
(annual growth, percent)	-	1.3	3.5	6.3	4	0-2.3
Whole milk products						
(million tons)	25.5	29.8	-	31.3	32.4	31-32
(annual growth, percent)	-	4.2	3.2	5.0	3.5	0.8-1.4
Margarine						
(million tons)	1.263	1.411	-	1.455	1.5	NA
(annual growth, percent)	-	-1.1	2.2	3.1	6	
Vegetable oil						
(million tons)	2.650	2.545	-	2.882	3.0	3.7-4.0
(annual growth, percent)	-	-4.9	-0.8	13.2	2	7.8-9.5
Granulated sugar						
(million tons)	10.1	11.8	-	12.7	13.7	NA
(annual growth, percent)	-	-5.6	3.2	7.6	7	
Confectionary goods <sup>e</sup>						
(million tons)	3.861	4.285	-	4.447	4.6	NA
(annual growth, percent)	-	3.2	2.1	3.8	4	
Canned goods						
(billion standard cans)	15.270	17.993	-	19.968	20.5	NA
(annual growth, percent)	-	4.9	3.3	11.0	2.7	
Nonalcoholic beverages						
(million dekaliters)	351	383	-	495	531	NA
(annual growth, percent)	-	7.3	1.8	29.2	7.3	

Table 9 (continued)

	<u>1980</u>	<u>1985</u>	<u>1981 -85<sup>a</sup></u>	<u>1986</u>	<u>1987<sup>b</sup></u>	<u>1990 Plan<sup>a</sup></u>
Mineral water						
(million dekaliters)	111	130	-	148	158	NA
(annual growth, percent)	-	-0.8	3.2	13.8	6.8	
Vodka products						
(million dekaliters)	295	238	-	147	NA	NA
(annual growth, percent)	-	-15.3	-4.2	-38.2	NA	
Wines						
(million dekaliters)	472	335	-	156	NA	NA
(annual growth, percent)	-	-26.0	-6.6	-53.4	NA	
"Cognac"						
(million dekaliters)	9.4	7.0	-	6.7	NA	NA
(annual growth, percent)	-	-29.3	-5.7	-4.3	NA	
"Champagne"						
(million bottles)	178	248	-	195	NA	NA
(annual growth, percent)	-	-2.4	6.9	-21.4	NA	
Beer						
(million dekaliters)	613	657	-	489	NA	NA
(annual growth, percent)	-	0.5	1.4	-25.6	NA	

<sup>a</sup> Growth rates shown are annual averages for 1981-85 and 1986-90.

<sup>b</sup> Preliminary. The apparent discrepancy between volume and growth indicators for 1987 is a result of Soviet reporting practices. Production volumes shown are those reported by the State Committee for Statistics. Because the reported volumes and growth rates embody different degrees of rounding by the Soviets, however, the rate of growth shown here may be based on either volume or reported growth, whichever yields the most precise measure of the actual percentage increase achieved in 1987.

<sup>c</sup> Industrially processed meat. The 1990 target reflects meat from state resources only, roughly 90 percent of all industrially processed meat. The remainder is meat from private sources that is custom processed at food-processing enterprises.

<sup>d</sup> Excluding production from private sources.

<sup>e</sup> Excluding production by food-service enterprises.

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[redacted]

Food quality, a sensitive issue for Soviet consumers, was the subject of much public discussion during 1987. The press contained several articles criticizing the decline in state standards for many products. A number of letters and articles also appeared deploring the low quality of Soviet bread, highlighted by what readers perceived as an attempt to impose hidden price hikes. The poor quality of Soviet tea was the subject of a Central Committee conference in the fall. [redacted]

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The Soviets devoted increased attention to the food-processing sector in 1987. Several Central Committee conferences were held to address the chronic problems afflicting the industry, such as the low share of prepackaged products, the lack of convenience foods, and inadequate storage for raw materials and food products. At a major conference in October, Gorbachev and Council of Ministers chairman Nikolay Ryzhkov lambasted the industry and announced far-reaching plans for modernizing and expanding food processing and storage. The leadership is counting on the machine-building sector to make a substantial contribution to this effort. The Soviets are hoping that the dissolution of the Ministry of Machine Building for Light and Food Industry and Household Appliance last year and the incorporation of many of its plants into the defense industries will enable machine builders to improve their support for food processing. [redacted]

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The performance of the food industry this year will depend to a large degree on success in the agricultural sector. Although the Soviets have formulated a program for making substantial improvements in food processing to improve quality, reduce waste, and expand the variety of products produced, it may be some years before the results of these measures are seen by consumers. [redacted]

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### Freight Transportation

Transport carriers were only able to muster a 0.7-percent increase in freight traffic in 1987, compared with an unusually strong 5-percent gain in 1986. The poor performance stemmed mainly from a decline in rail shipments that appears to be mostly the result of insufficient surge capacity to handle the backlog of shipments that built up during the crippling winter months. All freight carriers suffered from bottlenecks that developed during the unusually harsh winter and muted demand for transport services because of slow industrial output growth. The railroads and highway carriers managed to transport another successful grain crop with only isolated problems, and oil and gas output increases spurred pipeline deliveries (see table 10). [redacted]

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### Rail Recovery Over?

Although meeting the planned level, the volume of freight

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Table 10

USSR: Freight Transportation Shipments<sup>a</sup>

	(million tons)				
	<u>1980</u>	<u>1985</u>	<u>1986</u>	<u>1987<sup>b</sup></u>	<u>1990 Plan</u>
Rail	3,728	3,951	4,058	4,050	4,267-4,346
Maritime	228	240	250	252	NA
River	568	633	649	673	690-703
Highway <sup>c</sup>	6,456	6,320	6,653	6,844	7,458-7,521
Air	3	3	3	3	NA
Oil pipelines	627	631	653	660	NA
Gas pipelines	323	482	515	548	NA
	(annual growth, percent)				
	<u>1985</u>	<u>1981-85<sup>d</sup></u>	<u>1986</u>	<u>1987<sup>b</sup></u>	<u>1990 Plan<sup>d</sup></u>
Rail	1.0	1.2	2.7	-0.2	1.6-1.9
Maritime	2.1	1.0	4.2	0.8	NA
River	2.3	2.2	2.5	3.7	1.7-2.1
Highway	-0.6	-0.4	5.3	2.9	3.4-3.5
Air	3.2	1.3	0	0.8	NA
Oil pipelines	-2.6	0.1	3.5	1.1	NA
Gas pipelines	9.5	8.3	6.8	6.4	NA

<sup>a</sup> Because of multiple counting (shipments moved on more than one carrier), no total is shown.

<sup>b</sup> Preliminary.

<sup>c</sup> Excluding the non-common carrier highway fleet.

<sup>d</sup> Growth rates shown are annual averages for 1981-85 and 1986-90.

shipments carried by the railroads--the main Soviet barometer of freight transportation--fell by 0.2 percent in 1987, the first decline since 1982.<sup>5</sup> Freight traffic (measured in ton-kilometers) increased only 0.3 percent in 1987, following 2.6-percent growth in the previous year. Traffic grew while shipments declined because of a 0.5-percent increase in the average length of haul for freight cars. Productivity also deteriorated--the average freight car turnaround time increased, and the average train speed declined by 1.6 percent. Shortfalls were reported for shipments of timber, perishable food, metal structures, peat, refractory materials, and slag. Shipment targets were not met on 9 of the nation's 32 railroad systems, including the Kuybyshev, Volga Valley, West Siberian, Transcaucus, and Gorkiy railroads. On the bright side, labor productivity continued to soar, rising 6.8 percent, as the Belorussian experiment was extended to all of the nation's railways, releasing some 280,000 workers (see inset).

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The key reason for poor railroad performance last year was the 46-million ton delivery backlog--about 1 percent of annual shipments--that developed by the end of March and was not made up

<sup>5</sup> A little Soviet sleight of hand helped the railroads meet their 1987 shipments plan. According to data in the small statistical handbook, SSSR v tsifrakh, which was published in April 1987, the 1987 plan was 4.09 billion tons. According to the more comprehensive statistics yearbook (Narodnoye khozyaystvo SSSR za 70 let) issued in August, the shipments plan for 1987 was 4.05 billion tons. The downward revision may have been made because most of the shipments backlog early in the year had been blamed on industrial enterprises rather than the railroads themselves.

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## Inset

The Belorussian Railway Experiment

The Belorussian Railway experiment was designed to improve work incentives and to induce managers to use labor more efficiently. The experiment is the prototype for Gorbachev's wage reform and the descendant of a system pioneered in the Shchekino Chemical combine in the mid-1960s. Under the Shchekino system, an enterprise was given a fixed wage fund and allowed to cut personnel and use wage savings to finance bonuses for its remaining workers. The Belorussian system differs in that savings are used to finance higher wage rates, rather than bonuses, to give workers a permanent boost in earnings.

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Preparation for the Belorussian experiment began in 1984 with a partial hiring freeze that yielded 5,500 vacancies by May 1985. To boost productivity, work quotas were raised by an average of 20 percent. The railway then decided to increase wages 20 to 25 percent for workers and 30 to 35 percent for managerial and technical personnel. It determined that nearly 80 percent of the funds needed to introduce the higher wage rates would have to come from staff cuts and the remainder from overfulfilling shipment plans. In July 1985 the new wage scales went into effect and layoffs began. The experiment eventually freed up 12,000 workers. The Soviet press hailed it as a success, claiming that the railway achieved a 22.8-percent increase in labor productivity for the 11th Five-Year Plan (1981-85), compared with a planned increase of only 7.5 percent.

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The Belorussian experiment has now been extended to all railroads, but problems are arising. In Belorussia, staff cuts were facilitated by technological improvements made on the railroad during 1976-83, including mechanization of almost all loading and unloading work and automation of crossings. Other railroads, which do not enjoy the preferential access to supply accorded Belorussia, will have a hard time obtaining labor-saving equipment. Moreover, staff cuts are a hardship for railroads that are required to loan out large numbers of workers for the harvest and special civic projects. A Radio Moscow program blamed the Belorussian method for a decline in rail safety. According to the report, about four derailments occur daily on the Virgin Lands Railway alone because there are not enough people to properly maintain rail equipment.

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during the rest of the year. Record snowfalls and low temperatures over much of the USSR slowed and often brought freight trains to a halt during January and February, causing serious delivery delays on nearly all of the nation's railways. Poor performance continued in March as the aftereffect of the disruptions caused continued nationwide railcar dislocations. The situation became so bad that party secretary Yegor Ligachev held two urgent national telephone conferences with railway, regional party, and industry leaders early in the year and harshly criticized them for not adequately preparing for the severe winter; he expressed concern that the rail shipment backlog threatened to drag down the economy in 1987. [redacted]

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The inability of the railroads to rebound from the first quarter's large backlog indicates that there is very little slack capacity in the system. The rail leadership has been relying largely on putting more tonnage on the tracks to increase shipments, but this strategy may have run out of steam. The average train weight fell slightly in 1987--the first decline in at least 30 years. This contrasts with the 60-ton increase that spurred shipment growth in 1986; the 1986-90 plan calls for annual increases in average train weight of 100 tons. [redacted]

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If rail performance has reached a plateau, it is probably because Soviet planners are not moving rapidly enough to field the new capital--rolling stock and automated equipment--necessary to continue to expand the capacity of the rail system. For example, in order to increase train weight further, the railroads must introduce many more new "super-large" locomotives, increase the length of station and bypass tracks to accommodate longer trains, and push automated control to manage the increasing volumes of traffic passing through major rail hubs. [redacted]

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But upstream suppliers in industry--particularly in machine building--are failing to meet their contract deliveries. The Minister of Railways bitterly complained to the USSR Supreme Soviet in October that his organization was not receiving sufficient rolling stock. He pleaded that the machine-building ministries must not be allowed to continue to reduce deliveries of locomotives and railcars. The Ministry of Heavy, Power, and Transport Machine Building was singled out in the January-September plan fulfillment report for not fulfilling its production plans for mainline diesel locomotives and freight cars. Overall output targets for railroad equipment were not met in 1987. [redacted]

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#### Highway Shipping Continues Rebound

Shipments on the centrally directed highway carriers grew by 3 percent during 1987, marking the second straight successful year after declining volumes during 1983-85. Truck productivity, however, continued to decline--both idle time and the percentage

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[redacted]

of empty trips increased, which probably caused the decrease in the total amount of freight carried for each ton of capacity.

[redacted]

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The increase in shipments was probably the result of progress in shifting a greater share of trucking from departmental carriers--those managed by the industrial ministries--to the centralized fleet. Moscow plans to increase the share of truck traffic carried by the common carriers from 30 percent in 1985 to 38 percent in 1990. The Soviets hope that greater centralization of highway shipping will improve the notorious inefficiency of overall trucking with respect to labor, capital, and fuel usage. The departmental carriers often unnecessarily duplicate the services of the common carrier system. A study of the Moscow trucking industry, for example, concluded that nearly 70 percent of its routes were duplicated by the departmental carriers.

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